Claims

1. Thermally insulating material for a thermal barrier coating (3) of a substrate (2) for limiting heat transfer between the substrate (2) and an environment (7) of the substrate (2), wherein
- the thermally insulating material has at least one luminophore which can be excited to emit luminescent light with a particular emission wavelength, and
- the luminophore has at least one metal oxide with at least one trivalent metal A,

characterized in that

- the metal oxide is a mixed oxide selected from the perovskite group with the empirical formula $AA'O_3$ and/or a pyrochlore with the empirical formula $A_2B_2O_7$, A' being a trivalent metal and B a tetravalent metal.

2. Thermally insulating material according to Claim 1, wherein the luminophore for exciting the emission of luminescent light has an activator selected from the cerium and/or europium and/or dysprosium and/or terbium group.

3. Thermally insulating material according to Claim 2, wherein the activator is present in the luminophore in a proportion of up to 10 mol%.

4. Thermally insulating material according to one of Claims 1 to 3, wherein the trivalent metal A and/or the trivalent metal A' is a rare earth element Re.

5. Thermally insulating material according to Claim 4, wherein the trivalent metal A and/or the trivalent metal

A' is a rare earth element selected from the lanthanum and/or gadolinium and/or samarium group.

6. Thermally insulating material according to one of Claims 1 to 5, wherein the perovskite is a rare earth element.

7. Thermally insulating material according to Claim 6, wherein the empirical formula of the rare earth aluminate is $Gd_{0.25}La_{0.75}AlO_3$.

8. Thermally insulating material according to one of Claims 1 to 5, wherein the pyrochlore is selected from the rare earth hafnate and/or rare earth titanate and/or rare earth zirconate group.

9. Thermally insulating material according to Claim 8, wherein the rare earth zirconate is selected from the gadolinium zirconate and/or samarium zirconate group.

10. Thermally insulating material according to Claim 8, wherein the rare earth hafnate is lanthanum hafnate.

11. Arrangement of at least one thermal barrier coating (3) on a substrate (2) for limiting heat transfer between the substrate (2) and an environment (7) of the substrate (2), wherein the thermal barrier coating has a thermally insulating material according to one of Claims 1 to 10.

12. Arrangement according to Claim 11, wherein at least one additional thermal barrier coating (5) is present which is essentially luminophore-free.

13. Arrangement according to Claim 12, wherein the additional thermal barrier coating (5) is essentially opaque to excitation light for exciting the emission of luminescent light and/or to the luminescent light of the luminophore.

14. Arrangement according to Claim 13, wherein the thermal barrier coating (3) is disposed between the substrate (2) and the additional thermal barrier coating (5) in such a way that the luminescent light of the luminophore can essentially only pass through orifices (6) in the additional thermal barrier coating (5) into the environment (7) of the substrate (2).

15. Arrangement according to one of Claims 11 to 14, wherein the substrate is a component of an internal combustion engine.

16. Arrangement according to Claim 15, wherein the internal combustion engine is a gas turbine.